Time Well Spent

Development of a Data Validation Dashboard for Trauma Registries

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Background

- Accuracy of trauma registry (TR) data is vital for:
  - performance improvement (PI)
  - injury prevention and public health
  - research
  - benchmarking and outcome measurements

- The American College of Surgeons (ACS) Resources for Optimal Care of the Injured Patient states that "strategies for monitoring data validity are essential" to a trauma program. Re-abstraction of 5-10% of records is one approach.

- Our goal was to develop a time-efficient data validation program to reduce errors and improve data quality in the trauma registry (TR) of an academic trauma center.

- A clinical dashboard, modeled after those used in PI, was created to provide a quick look at key information to monitor progress in data accuracy. It includes both individual and group measures of quantity, quality and data accuracy.

Design/Methods

- University Medical Center, Regional (Level 1) state designated trauma center
  - Regional (County) trauma registry

- Compliant with National Trauma Data Bank (NTDB) and New York State trauma registry

- 2000 cases annually
  - Cases are collected concurrently on laptops
  - 2 FTE Nurse Registrars
  - 30% of cases are transferred from outside hospitals, requiring abstraction of 100 additional fields
  - Trauma One ™ Lancet Technology software

- 300 data fields
  - 25% electronic data transfer from the Electronic Medical Record
  - ICD-9CM injury and procedure codes are reported
  - AIS assigned via McKenzie map

Procedures

Established Individual Responsibility For Each Registry Record

- Set case volume goals to meet state and national deadlines
- Established goals for quality and work accuracy

Implemented Weekly Trauma Registry Data Review

- Critical errors (Date/time validation, bleeding disorder complication without V code indicating type of medication)
- NTDB errors (Out of range date or time, missing fields)
- Other errors (ICU stay without ICU LOS, Vent days without procedure code for amount of days ventilated)

Sample Individual Dashboard

Month, 2013	Goal	Week 1	Week 2	Week 3	Week 4
Volume Goals					
# new cases started	40/week	39	*	42	*
# cases completed	20-25	24	41	15	35
Accuracy 'Score'					
Error-free fields	80%	75%	68%	87%	83%
NTDB field errors	<5%	12.5%	12.2%	13.3%	5.7%
Quality 'Score'					
--- Excellent		-	-	-	75%
--- Satisfactory	75% (3 of 4)	100%	50%	50%	
--- Needing improvement	25% (1 of 4)	-	25%	50%	25%
--- Unsatisfactory	0% (0/4)	-	25%	-	-

*Registrar was not responsible for new patients this week

Implemented Monthly Trauma Registry Dashboard

- Case volume tally
- Adherence to data deadlines
- Overall accuracy and quality score
- Validation of a single supplemental field

Sample Registry Dashboard

Month	January	February	March	April
New case volume	118	96	123	148
Completed case volume	183	160	140	127
Days to completion (Month)	123 (Oct)	88 (Nov)	84 (Dec)	71 (Jan)
Accuracy 'Score'	97%	96%	99%	97%
Quality 'Score'	85%	97%	97%	100%
Supplemental Field check *	63%	73%	82%	57%

* Supplemental Field Check refers to error prone or interpretive fields not checked by any other report. For example, smoking history, injury time, rationale for transfer, indication for readmission.

Results

Reasonable Time Commitment

- 1-2 hours per week for Trauma Program Manager
- 1-2 hours per week for Data Base Manager
- 1 hour per week per Nurse Registrar
- Time saved during state and national data download

Substantive Gain In Data Validation

- Reduction in NTDB Level 1 errors from 9.54% in 2008 to 0% in 2012
- Total NTDB error rate reduced from 3.22% in 2009 to 0% in 2012
- Enhanced utilization of registry data for PI and clinical research
- ACS data monitoring requirement is met
- Sustained achievement of accuracy and quality goals

Enhanced Personnel Management

- Identification of registrar educational needs
- Identification and correction of individual variations in coding
- Individual performance evaluation
- Utilization during orientation of new staff

Resources

For sample copies of the following:

- ❑ Trauma Registry Annual PI Plan
- ❑ Registrars Weekly Dashboard
- ❑ Registry Monthly Dashboard
- ❑ Monthly Supplemental Field Check
- ❑ Weekly chart review tool
- ❑ Quality "Score" Definitions
- ❑ References

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References

1. American College of Surgeons Committee on Trauma. *Resources for Optimal Care of the Injured Patient.* Chicago, IL: American College of Surgeons; 2006.
2. Hlaing T, Hollister L, Aaland M. Trauma Registry Data Validation: Essential for Quality Trauma Care. *J Trauma.* 2006; 81 (6): 1400-1406.
3. Protetch J, Chappel D. Trauma Registry Data Validation: Building Objectivity. *J Trauma Nurs.* 2008; 15(2): 67-71.

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Trauma Registry Quality "Score" definition

Process: Data base manager identifies cases with ISS >=15, completed within past week, and submits one page paper report to Trauma Program Manager (TPM). TPM reviews selected cases for: E code, Pre-existing conditions, Injuries, Non Injuries, Procedures, and Complications. Variations are reviewed with Trauma Nurse Registrar weekly, and corrections made if necessary.

Rating	Definition	Goal per week (of 4 records reviewed)
Excellent	A job well done on a complex case Diagnosis coding and/or procedure coding from hospital was incomplete, or documentation was confusing and complex. No substantive errors identified.	
Satisfactory	Overall accurate and complete coding of injuries, non injuries and procedures. Anything missing would not affect Injury Severity Score (ISS) or Risk Adjusted Mortality Rate (RAMR) in state report. Only differences between TNR and reviewer are 'style' points	75%
Needs improvement	Missing codes or incorrect codes for minor things that do not affect ISS or RAMR. Missing minor procedure codes (suturing , aortogram, duplex) Failing to recognize that care deviated from clinical standards and should have been referred for PI review	25%
Unsatisfactory	Injury coding errors that would affect the ISS or RAMR Missing non injury codes of 'significance' (Coumadin use, UTI, pneumonia) Failure to code significant procedures (operative cases, IVC Filters, IR procedures) Missing (or over reported) injury codes that qualify patient for inclusion in state registry Missing admission with clear indication to be seen during hospitalization	0

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2012 Trauma Registry Monthly Supplemental Field Review

Month	Field	Findings
January	Smoking history 16-20 cases with ISS < 25, no ICU stay	
February	Injury Time: 16-20 cases of falls and MVC/MCC	
March	Thoracic or lumbar fracture with or w/o TLSO brace 805.2 and 3.23	
April	Rationale for transfer: 16-20 transfers, age>16, not burn, ½ from trauma centers	
May	Indication for Readmission: 16-20 cases of readmissions within 30 days of discharge	
June	Fall Height 16-20 cases with E code for Fall, mix low and high falls	
July	Activation Level: 16-20 cases of C or IND	
August	Unplanned ICU: 16-20 cases of ICU stay pts, ISS < 50	
September	Bleeding disorder and V code assigned 8-10 cases with Pre-exist bleeding dx 8-10 cases with V58. code	
October	Admit Service (not Trauma) 16-20 cases of burn and other cases	
November	Aortic/Angio coding 16-20 cases with embolization of solid organ or pelvis, or aortic injury	
December	Repeat whichever month in current year had below 80%	

Trauma Registry Weekly Chart Review Week ending: _____

MRN								
Registrar								
E code?								
Pre-existing condition agreement?								
Injury Code agreement?								
Non Injury Code agreement?								
Procedure code agreement?								
Complication agreement?								
“Score”								
Comments:								

Trauma Registry Weekly Chart Review

Week ending: ___March 22, 2013

MRN	2345677	12546665	213232	78999855
Registrar	One	One	One	One
E code?	✓	✓	✓	✓
Pre-existing condition agreement?	□ Add bleeding disorder, on Coumadin	✓	✓	✓
Injury Code agreement?	□ Grade 4 spleen not grade 2	✓	✓	✓
Non Injury Code agreement?	✓	□ V_code for Smoking history	✓	✓

Procedure code agreement?	□ Angio embolization	□ Laceration repair in ED	✓	✓
Complication agreement?	□ UTI	✓	✓	✓
"Score"	Unsatisfactory	Needs improvement	Satisfactory	Excellent
Comments:		Delayed trauma team activation should be referred to PI		Complex case. 47 days in ICU. ISS 59 Good pick up on complications